

Satellite Data Assimilation, Observing System Design, and the IOGOOS Program

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Climate variabilities in the Indian Ocean are tied to the global coupled system either through oceanic teleconnection or through the atmospheric bridge. The goal of the **Indian Ocean component of the Global Ocean Observing System (IOGOOS) Program** is to understand and predict these variabilities and their relation to the global climate. The capability building and implementation of IOGOOS to be addressed in this meeting require the synthesis of various types of observations with dynamical models. Existing in-situ observations, although providing measurements into great depths of the ocean, are too sparse to capture variabilities in many temporal and spatial scales. The assimilation of satellite data is thus critical to IOGOOS. This task is undertaken by the Jet Propulsion Laboratory, California Institute of Technology as part of the **National Ocean Partnership (NOPP) Program**. The effort combines space-borne measurements from altimeters, scatterometers, and infrared radiameters and ancillary in-situ data with state-of-the-art ocean general circulation models using advanced assimilation schemes. The resultant estimate of the time-evolving, three-dimensional ocean circulation is being used to diagnose dominant processes responsible for seasonal-to-interannual variabilities in the Indian Ocean associated with Monsoon and Indian Ocean Dipole Mode. The estimate also provides optimal oceanic open-boundary conditions for regional models of the Coastal GOOS Program. In addition, the effort is capable of supporting the design of observational network of IOGOOS by testing the impact of different types of observations in different regions and time periods. Future assimilation of in-situ data to be collected by IOGOOS will in turn improve the assimilation product. As such, the effort will bridge the observational and modeling elements to address the scientific issues of the IOGOOS Program.